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IN THE MATTER OF

TELECOMMUNICATIONS SERVICES
INSIDE WIRING

CUSTOMER PREMISES EQUIPMENT

CS DOCKET No. 95-184

COMMENTS OF COMPAQ COMPUTER CORPORATION

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SUMMARY

The rules that the Commission adopts in this proceeding will have a profound effect on the future development of the communications market.

Compaq believes that these rules should foster a market in which consumers are able to use a wide range of competitively provided equipment to access multiple services, delivered over multiple distribution systems. To do so, Compaq urges the Commission to adopt the following rules governing customer premises equipment ("CPE") and inside wiring used in connection with cable systems:

CUSTOMER PREMISES EQUIPMENT. Customer premises equipment -- including the personal computer -- can play a critical role in facilitating easy and affordable user access to, and interaction with, services delivered over cable systems. In order to allow consumers to obtain the full benefit of these services, the Commission should extend its CPE unbundling rule to premises-based equipment used in conjunction with cable systems. Under this approach, cable system operators would be *permitted* to offer CPE to their customers, but could not *require* customers to lease or purchase their equipment. The Commission also should adopt rules necessary to prevent network operators from cross-subsidizing network-provided CPE with revenue from service operations.

The Commission has ample legal authority to mandate cable CPE unbundling and prevent cross-subsidization. Section 304 of the Telecommunications Act of 1996 directs the Commission to "adopt regulations to assure the com-

mercial availability . . . of . . . equipment used by consumers to access multichannel video programming and other services offered over multichannel video programming systems." A cable system plainly is a "multichannel video programming system." The unbundling requirement thus applies to *all* CPE interconnected to a cable system -- regardless of whether the system is being used to access traditional one-way "multi-channel video programming" or "other services" carried over the same facilities. Section 304 also expressly authorizes the Commission to adopt regulations necessary to prevent cross-subsidization.

The Commission also should adopt rules that facilitate interconnection of competitively provided cable CPE. Consumers should be able to interconnect such equipment to the cable system on the same terms as cable-system-provided CPE. To facilitate this right of interconnection, while preventing harm to the cable network, the Commission should adopt a Part 68-like equipment registration program for cable CPE. The Commission also should prescribe a standard interface between CPE and cable systems.

In addition, the Commission needs to prescribe rules that will allow independent manufacturers to develop CPE that can interoperate with cable systems. Specifically, the Commission should require cable systems to make advanced disclosure of information regarding the physical and logical interfaces to their networks. Because cable operators retain market power, it would be appropriate to apply the same advanced disclosure requirements as are applicable to the Bell Operating Companies.

Implementation of a network disclosure regime should be sufficient to promote interoperability in most cases. As Congress has recognized, however, it may be necessary for the Commission to adopt standards in order to achieve its goal of "commercial availability" of cable CPE. Promotion of commercial availability of the cable modem is one area that may well justify active Commission involvement in the standards-setting process.

INSIDE WIRING. Compaq urges the Commission to adopt a regulatory regime that will provide consumers with access to multiple services over competing networks. In order to achieve this goal, the Commission should ensure that cable subscribers -- rather than cable system operators -- have control over cable inside wiring, just as telephone subscribers now have control over telephone inside wiring.

To implement this approach, the Commission should establish a harmonized demarcation point which defines all in-building wiring dedicated to a specific customer as inside wiring. The Commission should then permit cable subscribers to: access and control existing cable inside wiring owned by the service provider; purchase existing cable inside wiring upon service termination; and own and control all cable inside wiring installed or substantially modified after December 31, 1997.

The Commission has the necessary legal authority to adopt this approach. In permitting cable subscribers to purchase premises-based wiring following service termination, Section 16(d) of the Cable Act of 1992 established

the *minimum* action that the Commission must take to promote competition among multiple network service providers. Title I of the Communications Act of 1934 and Section 304 of the Telecommunications Act of 1996 provide authority for the Commission to adopt rules providing for broader consumer ownership and control of inside wiring.

Subscriber control over inside wiring can be accomplished in a manner that ensures compliance with existing cable leakage and signal quality standards. Once subscribers are given control over this wiring, they should be required to maintain and use it in a manner that is consistent with the Commission's rules designed to prevent signal leakage. At the same time, however, cable operators should continue to bear the ultimate responsibility to detect and eliminate cable leakage during the period in which they provide service. The Commission should continue to hold cable system operators responsible for the quality of signals delivered to the subscriber's terminal equipment, except where any degradation in quality is the result of subscriber-owned wiring.

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COMMENTS OF COMPAQ COMPUTER CORPORATION

Compaq Computer Corporation ("Compaq") is pleased to submit these comments in response to the Commission's Notice of Proposed Rulemaking.¹

Compaq is the fifth largest computer company in the world, and the world's leading manufacturer of personal computers ("PCs"). Many of Compaq's PCs are equipped with facsimile/data modems, telephone and answering machine capability, speaker-phones, high fidelity sound systems, television tuner boards, and high-speed CD-ROM devices. These products can be used with a wide range of audio, video, and data distribution networks.

Compaq also is a leader in the market for computer servers and internetworking equipment. The company anticipates that its products will play a key role in providing users with ready access to the vast resources of the Internet and other information services.

¹ See *Telecommunications Services Inside Wiring*, Notice of Proposed Rulemaking, CS Docket No. 95-184, (rel. Jan. 26, 1996) ("*Notice*").

INTRODUCTION

This proceeding comes at an historic moment. Rapid advances in digital technology, data compression techniques, and PC-based communications are breaking down boundaries that have long separated telephony and cable services. Both telephone networks and cable systems are becoming full-service components of the National (and Global) Information Infrastructure, capable of delivering a full array of voice, data, and video services to subscribers. At the same time, the recently enacted Telecommunications Act of 1996² has removed many of the artificial regulatory barriers that have long prevented telephone companies and cable system operators from competing against each other.

The Commission initiated this proceeding to consider whether -- in light of the convergence of telephony and cable service -- it should harmonize the regulatory regimes applicable to customer premises equipment ("CPE") and inside wiring used in connection with telephone networks and cable systems. The rules that the Commission adopts in this proceeding will have a profound effect on the future development of the communications market. Compaq believes that these rules should foster a market in which consumers are able to use a wide range of competitively provided equipment to access multiple services, delivered over multiple distribution systems. To do so, the Commission should extend its pro-competitive policies governing telephone CPE and inside wiring to cable CPE and inside wiring.

² Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat. 56, 104th Cong., 2d Sess. (1996).

I. THE EMERGING COMMUNICATIONS MARKET

The policies adopted in this proceeding should seek to foster a communications market characterized by competition, user choice, and innovation. In this Section, Compaq outlines its vision of what such a market would look like. In subsequent Sections, Compaq proposes specific regulatory policies that will make the development of such a market a reality.

A. THE PC: A MULTI-FUNCTIONAL PLATFORM

In the coming years, Compaq anticipates that customer premises equipment will provide consumers with access to a vast array of voice, data, and video services. The personal computer ("PC"), in particular, will play a central role in facilitating easy and affordable user access to, and interaction with, these services. While the PC was once viewed principally as a computational device, it increasingly will come to be seen as a multi-functional "platform," well-suited to receive, display, and transmit a wide variety of content delivered over multiple broadband distribution networks.

As the broadband infrastructure develops, the personal computer will evolve with it. Future PCs will take varying forms to accommodate diverse user needs. Residential consumers may use a variety of PCs -- from large-screen information and entertainment systems in the living room, to desk-based PCs with sophisticated telephone answering systems in the study, to small "information appliances" elsewhere in the home.

Ultimately, Compaq expects that these devices will be linked to each other -- using premises-based wiring as well as radio signals -- by means of home local area networks ("Home LANs") that will allow individual devices to share components such as software, hard drives, and modems. The component sharing across these elements will result in significant efficiencies, thereby making the cost of the total system competitive with current prices for individual component services.³

The Home LAN will allow consumers to transform their dwelling places into "smart houses" in which their PC controls home security, energy management, and lighting control systems.⁴ It also will provide access to the countless services carried to the home over multiple transmission networks. Among the most-often-discussed applications are video conferencing, high speed

³ Substantial progress has been made in developing industry standards necessary to support home automation. For example, the Consumer Electronics Manufacturers Association, formerly known as the Electronic Industries Association/Consumer Electronics Group, has developed the Consumer Electronics Bus ("CEBus"). CEBus is an open standard that is intended to standardize communications between home appliances, thereby making possible numerous home automation applications, while providing for in-home distribution of information delivered by means of telephone, cable, wireless cable, satellite, or other distribution networks. Other entities have been developing proprietary home automation technologies as well, such as LONWorks and SmartHouse.

⁴ The Commission has recognized the benefits that home automation systems can provide. *See Amendment of Part 15 to Enable the Widespread Implementation of Home Automation and Communication Technology*, Report and Order, 7 FCC Rcd 4476, 4476 (1992) (Home automation systems "can help minimize losses due to fire and theft; control lights and appliances within the home; monitor and control energy use; and distribute entertainment programming.").

data access (including Internet access), distance learning, tele-commuting, electronic banking, home shopping, near video-on-demand, and switched digital video. Ultimately, market forces will determine which services become available over these networks. Indeed, given the limitless potential of digital technology, the most important applications may yet to have been devised.

B. CABLE: THE EMERGING CONDUIT

Compaq anticipates that the public switched telephone network will play a major role in the delivery of voice, data, and video services to the home. At the same time, however, Compaq believes that cable systems will become an increasingly important conduit for the distribution of bandwidth-intensive, time-sensitive information.

Cable delivery systems represent a *quantum leap* in capacity over the current copper-based telephone network. Most analysts believe that hybrid fiber/coaxial cable systems have the ability to move data at rates ranging from 10 to 40 million bits ("megabits") per second ("Mbps"). At the highest of these rates, a user could download a full-length motion picture in just *14 minutes*.⁵

⁵ This estimate (and subsequent throughput estimates herein) are derived from a *Washington Post* analysis depicting the time required to download the movie *Jurassic Park*, which contains approximately three gigabytes (24 billion bits) of information. See Mike Mills, *Making Copper a Bit Faster*, Wash. Post, Feb. 22, 1996, at D9.

The vast improvement in throughput rate that cable can provide becomes clear when its capability is compared to existing telephone-based technologies:

- **The V.34 Modem.** Today's state-of-the-art telephone modem,⁶ the V.34, can operate at a speed of 28,800 bits per second (28.8 Kbps). Using the V.34, the waiting time to download a full-length movie transmitted over the telephone network would be approximately *16 days*.
- **ISDN.** Integrated Services Digital Network ("ISDN") technology allows the existing copper-based telephone infrastructure to carry information at the rate of 128,000 bits per second (128 Kbps). At this rate, a telephone customer would have to wait *seven days* to download a full-length motion picture.⁷
- **ADSL.** Asymmetric Digital Subscriber Line ("ADSL") technology could increase telephone throughput rates substantially.⁸ Current ADSL technology allows data rates of 1.5 million bits per second (1.5 Mbps), approximately the same speed as a costly, high capacity T-1 line. Even using this technology, however, a telephone customer seeking to download a full-length motion picture would have to wait about *six hours*.⁹

⁶ A modem is a premises-based device that makes it possible to send digital data -- such as that generated by a personal computer -- over a transmission network.

⁷ ISDN, moreover, has not been deployed throughout the country. Where it has been, it is often priced at inefficient, non-cost-based levels, thereby deterring its use.

⁸ Like ISDN, ADSL allows for the transmission of video content over the telephone companies' existing facilities. ADSL does so by deploying "paired" equipment at the carrier's central office and the customer's premises.

⁹ Future advances in digital subscriber line technology could boost the throughput rate as high as 8 million bits per second (8 Mbps). ADSL technology, however, remains fairly expensive. Current estimates are that the per customer cost for ADSL equipment is approximately \$1,000, plus an additional \$300 for installation.

Of course, by deploying their own fiber optic networks, telephone companies will be able to match -- or even exceed -- the throughput rate that today's cable systems can offer. Until such upgrades occur, however, Compaq anticipates that more and more consumers will seek to use cable networks as the medium-of-choice for the transmission of time-sensitive, bandwidth-intensive information content.¹⁰

Transforming existing cable systems into high-capacity information conduits will not be technically difficult. Today, most cable systems are based on a "tree and branch" structure, in which coaxial cable from the cable head-end "branches off" to serve individual subscribers. These systems were designed for one-way broadcast-type transmission of packaged video programming. In the coming years, however, most cable subscribers will be served by hybrid fiber/coaxial cable systems, in which the existing coaxial cable "trunk" will be replaced by a fiber link running from the cable head-end to a local neighborhood node. Each node will serve several hundred households, which will be connected to it by coaxial cable. This configuration reduces system maintenance costs, improves quality, and results in higher reliability.

¹⁰ See generally Sharon Eisner Gillett, Massachusetts Institute of Technology, *Connecting Homes to the Internet: An Engineering Cost Model of Cable vs. ISDN*, at 1 (1995) ("Internet access over cable can provide the same average bandwidth and four times the peak ISDN bandwidth for less than half the capital cost per subscriber. . . . Cable-based access also has better service characteristics: it can support both full-time Internet connections and higher peak bandwidth, such as a 4 Mbps cable service that provides thirty-two times the peak bandwidth of ISDN.").

Compaq projects that, within the next three years, cable operators will connect as many as 75 percent of today's cable subscribers to a hybrid fiber/coax infrastructure. Once this new infrastructure has been deployed, relatively minor equipment upgrades -- such as the addition of two-way amplifiers and filters -- will be required to provide two-way interactive services.¹¹ At the customer's premises, the only additional equipment that will be needed is a cable modem. The current generation of cable modems costs \$500 to \$700 each. Mass production and competitive forces, however, should push prices down to approximately \$300 in the coming years -- with \$100 cable modems a distinct possibility. Once this has been accomplished, consumers will have access to previously unobtainable services -- at previously inconceivable speeds.¹²

¹¹ Such upgrades are already occurring in selected sites across the country. For example, in December 1994, Time Warner Cable launched the Full Service Network ("FSN"), a multimedia interactive system, in the suburbs of Orlando, Florida. FSN permits subscribers to use Time Warner's cable infrastructure to access games, use home shopping services, and receive video-on-demand. In Alexandria, Virginia, Jones Intercable is providing Internet access and -- in some instances -- telephony via the cable network. In Elmira, New York, Time Warner offers Internet access over its cable lines, including access to the local library, the local newspaper, and a community college.

¹² Important though it is, cable will not be the only high-capacity alternative delivery system. As noted above, telephone companies may choose to upgrade their networks through the deployment of their own hybrid fiber/coax networks. Indeed, some analysts believe that carriers may go further -- deploying networks using fiber-to-the-curb or fiber-to-the-home topographies. While some carriers have deployed fiber-based networks on a small-scale basis, such upgrades are not likely to occur on a large scale during the next few years.

In addition to the telephone network, Compaq anticipates that a variety of radio and satellite-based services also will vie to provide users with a full range of

As the Commission goes forward, it should adopt regulations that can turn this vision into a reality. As explained below, the best way to do so is to ensure that consumers are able to have the benefits of a competitive market in customer premises equipment, while being able to use cable inside wiring to access multiple services, carried over multiple distribution networks.

broadband services. For example, Direct-to-Home satellites services, such as those operated by DirecTV and PrimeStar, and those to be offered by MCI and Echostar, offer the possibility of delivering information at speeds that approach those of hybrid fiber/coax cable systems. At the present time, these systems are being optimized for one-way transmission of multi-channel video programming. While some providers are considering "head-end-in-the-sky" and "ATM-in-the-sky" services -- which would allow for two-way transport of voice, data, and video services -- these services are not likely to be available until after the year 2000.

Compaq also anticipates that other delivery systems -- such as Advanced Television ("ATV"), Satellite Master Antenna Service ("SMATV") and Multichannel Multipoint Distribution Service ("wireless cable") -- increasingly will provide subscribers with access to alternative sources of multichannel video programming. Again, however, widespread use of these technologies for the full range of interactive services may not occur for a number of years. Nonetheless, they hold the promise of further competition in the broadband marketplace.

II. THE COMMISSION SHOULD ADOPT REGULATIONS THAT FOSTER A COMPETITIVE MARKET FOR ALL CUSTOMER PREMISES EQUIPMENT

CPE provides a means for end-users to access, and interact with, services offered over multiple distribution networks. Compaq believes that, if consumers are to make optimal use of available services, they must be able to use the CPE that best meets their needs -- *regardless* of whether it is connected to the telephone network or a cable system. Compaq is pleased, therefore, that the Commission has tentatively concluded that consumers should be able to both "purchase" and "connect" competitively provided cable CPE.¹³ As the Commission correctly notes:

improving cable subscribers' rights to acquire and provide their own cable-related CPE would benefit subscribers This should promote marketplace entry by communications equipment vendors and facilitate competition among these vendors, as we have seen in the telephone context. A competitive marketplace should lead to the development of innovative types of CPE, improved performance of existing and new CPE, and improved maintenance of CPE.¹⁴

¹³ *Notice* at ¶ 72.

¹⁴ *Notice* at ¶ 75. In the *Notice*, the Commission also tentatively concludes that the existing *Computer II* regime -- which includes unbundling, interconnection, and network disclosure requirements -- should apply to telephone company narrowband facilities regardless of whether they are used to provide services subject to regulation under Title II or Title VI of the Communications Act. See *id.* at ¶ 73. Compaq agrees.

The Commission previously concluded that its *Computer II* requirements were applicable to video services offered over telephone-company provided narrowband facilities. Thus, in the *Chesapeake and Potomac Video Dialtone 214 Order*, the Commission noted that carriers that provide video dialtone service are obligated to "comply with the Commission's rules on the provision of CPE."

As explained below, Compaq believes that these goals can best be achieved by extending to cable CPE the Commission's telephony policies requiring unbundling of CPE, barring cross-subsidization, and permitting CPE interconnection. In addition, Compaq believes that the Commission should take action to ensure that competitively provided CPE will be able to interoperate with cable systems. To do so, the Commission should extend network disclosure requirements to cable systems. Compaq also urges the Commission to prescribe standards to the extent necessary to ensure CPE interconnection and interoperability.

**A. CABLE SYSTEM OPERATORS SHOULD BE REQUIRED TO
OFFER CABLE CPE ON AN UNBUNDLED BASIS, FREE
FROM CROSS-SUBSIDIZATION**

1. COMPAQ PROPOSAL

The Commission's customer premises equipment unbundling rule provides that:

Application of the Chesapeake and Potomac Tel. Co. of Virginia, Order and Authorization, File No. W-P-C-6834, FCC 95-15, at ¶ 35 (rel. Jan. 20, 1995). The recently adopted Telecommunications Act of 1996 has vacated the Commission's video dialtone rules. See Telecommunications Act of 1996, Pub. L. No. 104-104, § 302(b), 104th Cong., 2d Sess. (1996). Under the new legislation, telephone companies can provide video service on a common carrier basis (subject to Title II rules), as "cable service" (subject to Title VI rules), or as an "open video system" (subject to certain Title VI rules). See *id.* at § 302(a) (creating new Sections 651 and 653 of the Communications Act of 1934). Regardless of the regulatory regime, however, the same pro-competitive rules should apply to premises-based equipment used in connection with all telephone-company-provided services.

[T]he carrier provision of customer premises equipment used in conjunction with the interstate telecommunications network shall be separate and distinct from provision of common carrier communications services¹⁵

Compaq believes that the Commission should extend this rule to premises-based equipment used in conjunction with cable systems. Under this approach, users would be able to purchase cable CPE -- such as cable modems and set-top boxes -- from the provider of their choice. While cable system operators would be *permitted* to offer CPE to their customers, they could not *require* customers to lease or purchase their equipment.¹⁶ Moreover, if a customer chose to obtain CPE from the

¹⁵ 47 C.F.R. § 64.702(e).

¹⁶ As discussed below, *see infra* § III.A.1.a., Compaq proposes that, in single unit residences, the cable and telephone network demarcation points should be set at 12 inches *inside* the subscriber's premises. The Commission has made clear, in the telephony context, that *all* equipment located on the customer premises -- regardless of which side of the demarcation point it is located on -- constitutes CPE and, absent a waiver, must be provided on an unbundled basis. *See, e.g., Verilink Corporation's Petition for Rulemaking to Amend the Commission's Part 68 Rules to Authorize Regulated Carriers to Provide Certain Line Build Out Functionality as a Part of Regulated Network Equipment on Customer Premises*, Memorandum Opinion and Order, 10 FCC Rcd 8914, 8920-21 (1995) ("*Verilink LBO Order*") (declining to allow carriers to provide line build out function as part of "network interface" equipment located on the customer premises); *Amendment to Sections 64.702 of the Commission's Rules and Regulations (Third Computer Inquiry)*, Phase II Order, 2 FCC Rcd 3072, 3105 (1987), *vacated on other grounds sub nom. California v. FCC*, 905 F.2d 1217 (9th Cir. 1990) (granting a limited waiver of the CPE unbundling rule to allow carriers to "deploy [loop back testing] equipment on the customer premises on the network side of the demarcation point.").

The same rule should apply in the cable context. Under this approach, equipment (such as cable modems) located on the customer premises would be provided on a competitive, unbundled basis. Cable operators would not be able to defeat this requirement by placing such premises-based equipment on the

cable operator, the operator would be required to offer equipment on a "stand-alone" basis.

At the same time, Compaq recognizes the legitimate interest that content providers have in preventing theft of their content. Compaq believes that allowing cable system operators to bundle a security-only device with their service would fully address this concern. The Commission must make clear, however, that cable system operators are not permitted to incorporate any non-security functionality in such devices. Rather, all non-security functionality must be offered through unbundled, competitively provided equipment.¹⁷

network side of the demarcation point. Nor would they be permitted to designate a portion of the customer's premises as network "controlled space" in order to achieve this result.

Because Compaq proposes to locate the cable demarcation point for multiple dwelling units *outside* the subscriber's premises, *see infra* § III.A.1.a., cable systems would not be able to locate any equipment (other than a security-only device) on the customer's premises.

¹⁷ This approach is consistent with the Commission's position in the *Cable Compatibility* proceeding. Acting pursuant to Section 17 of the Cable Act of 1992, Cable Television Consumer Protection and Competition Act of 1992, Pub. L. No. 385, § 17, 106 Stat. 1460, 1491 (1992) (codified at 47 U.S.C. § 554A), the Commission established regulations designed to allow cable subscribers "to utilize [consumer electronics] equipment offered by a variety of suppliers, including the cable system operator, in a competitive market." *Implementation of Section 17 of the Cable Television Consumer Protection and Competition Act of 1992*, First Report and Order, 9 FCC Rcd 1981, 1982 (1994), *petitions for recon. pending* ("Cable Compatibility Order"). Under the Commission's plan, security functions (such as signal descrambling) will be performed by equipment supplied by cable systems. At the same time, the adoption of a standardized "Decoder Interface" will allow equipment-based non-security functions to be made available "through new products offered by retail vendors . . . thereby promoting competition in the market for equipment used to receive cable service." *Id.* at 1988-89.

The Commission also should adopt rules necessary to prevent network operators from cross-subsidizing CPE with revenue from their service operations. In particular, the Commission should expressly bar cable operators that obtain cable CPE from non-affiliated vendors from reselling that equipment to end-users at less than the operator's per-unit cost.

2. POLICY CONSIDERATIONS

a. Unbundling

Experience in the telephone CPE market demonstrates that only a competitive market can ensure the availability of a wide selection of equipment, delivered at competitive prices, that can meet a broad range of user needs. Such a market requires the participation of "independent" equipment manufacturers. Such manufacturers market CPE to end-users, rather than acting predominantly as suppliers for networks. Historically, these manufacturers -- rather than network-affiliated manufacturers -- have been the primary source of innovation in the customer equipment market. For example, the "fast modem" was developed by independent manufacturers.¹⁸

In the telephony market, local exchange carriers have sometimes sought to prevent consumers from using competitively provided premises-based customer equipment. The carriers' incentive to do so is clear: CPE manufacturers

¹⁸ Indeed, the Bell System once asserted that it would never be technically feasible to develop a telephone modem that could move data at a rate greater than 2,400 bits per second.

offer equipment that can perform functions that would otherwise be performed in the network, or that can reduce demand for network capacity.¹⁹ Fortunately, the Commission's pro-competitive rules have generally been able to thwart these carrier efforts.

The Commission has repeatedly acknowledged the success of its pro-competitive regulatory regime governing telephone CPE. As the Commission observed in the *NYNEX Enterprise Services Order*:

Today, the domestic data communications customer-premises equipment (CPE) industry is a competitive marketplace, permitting users to select from a large variety of products offered at a wide range of prices. . . . The classification of user-providable equipment as unregulated CPE has . . . driven improvements in equipment quality, lowered CPE prices, and improved the performance of users' data communications networks.²⁰

The Commission also has recognized that consumers will realize the same competitive benefits if competition is extended to the cable CPE market. For example, in the *Cable Compatibility Order*, the Commission noted that:

¹⁹ For example, a customer seeking to obtain the necessary capacity to support transmission of full-motion video could deploy premises-based ADSL equipment, rather than leasing an expensive T-1 line from the telephone company. This is sometimes referred to as "inter-modal" competition.

²⁰ *NYNEX Telephone Companies Tariff FCC No. 1 Applications for Review*, Memorandum Opinion and Order, 9 FCC Rcd 1608, 1608 (1994); *see also Verilink LBO Order*, 10 FCC Rcd at 8921 (noting that the Commission's CPE policies have resulted in improvements in the quality of premises-based equipment, lower prices, improved performance of data communications networks, and job creation).

opening [the cable CPE] markets to competitive equipment providers will give product developers and manufacturers, as well as cable system operators, the ability and incentives to introduce new products and to respond to consumer demand. In return, consumers will have greater access to technology with new features and functions.²¹

Cable operators, however, show every indication that they are inclined to limit user choice in the equipment market. Because cable companies continue to enjoy substantial market power, they have been able to eliminate user choice in the market for cable set-top boxes. They also have indicated that -- as cable networks are upgraded to two-way conduits -- they intend to bundle the all-important cable modem with their service.²² Unless the Commission acts to ensure a competitive market in cable CPE, users will be faced with limited choice, high prices, and reduced innovation.

²¹ *Cable Compatibility Order*, 9 FCC Rcd at 1982; see also *Implementation of Sections of the Cable Television Consumer Protection and Competition Act of 1992: Rate Regulation*, Report and Order & Further Notice of Proposed Rulemaking, 8 FCC Rcd 5631, 5800 (1993) ("Congress intended our regulations to encourage competition in the provision of [cable customer premises] equipment and installation services."). See generally David Alan Nall, *Cable Television Subscriber Equipment: Lessons From the Common Carrier Experience*, 46 Fed. Comm. L.J. 125, 127-32 (1993) (comparing the cable equipment provisions of the 1992 Cable Act with the Commission's telephone CPE unbundling rules).

²² Cable systems already have ordered at least 550,000 cable modems from various manufacturers. See Mark Landler, *Where On Line Is On Cable*, N.Y. Times, Jan. 31, 1996, at D1, D4.

b. Cross-Subsidization

The Commission has long recognized that common carriers can use revenues from their transmission service to cross-subsidize their competitive CPE offerings. Such conduct, the Commission has noted, can severely distort competition in the CPE market.²³ By separating the provision of regulated telephone transmission service from the provision of competitive CPE, the Commission's unbundling rule plainly makes cross-subsidization more difficult. The Commission also has adopted cost allocation rules designed to limit the ability of carriers to shift costs from their competitive CPE offerings to their basic telecommunications service operations.²⁴

Precisely the same considerations are applicable to cable CPE. If cable system operators are able to use revenue generated from their provision of services to provide equipment to end-users at artificially low prices, they will be able to foreclose competition in this important new market. Unbundling CPE from cable-system-provided services will make it more difficult for network operators to shift equipment-related costs to their service operation. As experience in the telephone

²³ See, e.g., *Amendment of Sections 64.702 of the Commission's Rules and Regulations (Third Computer Inquiry)*, Report and Order, 104 F.C.C.2d 958, 1074 (1986), *reversed on other grounds sub nom. California v. FCC*, 905 F.2d 1217 (1990) ("[C]ost shifting can have adverse impacts on . . . competition in unregulated markets, by providing an opportunity for carriers to charge artificially low prices for their unregulated goods and services.").

²⁴ See, e.g., *Separation of Costs of Regulated Telephone Service from Costs on Non-regulated Activities*, Report and Order, 2 FCC Rcd 1298 (1987) (subsequent history omitted).

market has demonstrated, however, additional restrictions on cross-subsidization may be appropriate.

Cable system operators generally do not manufacture the premises-based equipment used with their systems. Rather, they obtain the necessary devices from non-affiliated vendors. There is every indication that cable operators will continue to use this approach as new types of cable CPE -- such as the cable modem -- become available.²⁵ At a minimum, the Commission should expressly bar cable operators that obtain cable CPE from non-affiliated vendors from reselling that equipment to end-users at less than the operator's per-unit cost. The Commission also should consider the desirability of adopting additional rules governing allocation of "joint and common costs" between cable systems' service operations and their provision of cable CPE.

3. FCC LEGAL AUTHORITY

Unbundling cable CPE and taking other measures to deter cross-subsidization of CPE are well within the Commission's statutory authority. This is true regardless of whether the equipment is used in connection with traditional cable service (*i.e.*, multichannel video programming service) or telecommunications service (such as cable telephony or information access services).

²⁵ See *supra* n.22.